Chapter 7
Subsistence Remains

The 2010 investigations at the Ashe Ferry site recovered substantial quantities of plant and animal remains from discrete deposits in feature contexts. Analysis of these plant and animal remains documents the subsistence practices and other resource uses by site inhabitants during the Ashe Ferry and Early Brown phase occupations, and provides the primary data sets for characterization of site function. The following presentation and discussion of these analyses frames the case for multi-function seasonal site occupations during the Ashe Ferry and Early Brown phases, with special emphases on arboreal nut gathering and processing.

The vast majority of archaeobotanical and archaeofaunal remains recovered from the Ashe Ferry site represent disposal or abandonment of fuel or food residues that reflect the subsistence and firewood-selection practices of the site's inhabitants. Carbonized botanical remains from 38YK533 include 291 samples (12.3kg) recovered from discrete deposits within 69 cultural features and 18 other subplowzone contexts. Ninety-nine of these botanical samples were recovered by flotation processing of soil samples; 167 samples were obtained from soils waterscreen sorted through 1/16-inch mesh, and 28 botanical samples were hand recovered during excavation, and include nine samples retained for radiocarbon assay. Analysis of archaeobotanical materials examined a subsample of 563g of plant remains recovered by flotation from 16 discrete features that exhibited the greatest density and diversity of food residues (as opposed to wood charcoal). These samples are dominated by arboreal nuts, including acorns, hickory nuts, walnuts and chestnuts. Other foodstuffs include fleshy fruits (i.e., blueberry, blackberry, maypops, mulberry, grape, plum, and persimmon), starchy and oily seeds (i.e., bearsfoot, chenopod, knotweed, little barley, maygrass, and sunflower), and maize.

Soil conditions at 38YK533 apparently compromised preservation of archaeofaunal remains, and the assemblage of animal bones includes only 183.6g of material (including 357 identifiable specimens) recovered from 31 features and 49 non-feature contexts (buried plowzone/remnant A-horizon). Only three contexts (Features 20, 41, and 46) yielded more than 20 identifiable specimens. With the exception of the few samples found in the plow zone, all animal bones not individually excavated and bagged during feature excavation were recovered by waterscreening or flotation. Analysis of archaeofaunal remains from Ashe Ferry considered all recovered specimens, but defined only six taxa (white-tailed deer, domestic dog, wild turkey, eastern box turtle, stinkpot turtle, and bullhead catfish) to specific level. These results indicate use of both terrestrial and aquatic species, but offer little information about the breadth or focus of hunting activities at 38YK533, and are most reflective of the extent of taphonomic process due to chemical weathering and leaching of soluble minerals (e.g., calcium) in loose, sandy acidic soils.

Archaeobotanical specialists Ashley A. Peles and Dr. C. Margaret Scarry undertook analysis of plant remains from Ashe Ferry, and archaeofaunal specialist Dr. Thomas R. Whyte analyzed the animal remains from the site. Their discussions of analysis and findings concerning subsistence residues from 38YK533 follow.

Plant Remains from the Ashe Ferry Site (38YK533),
A Multi-Component Site In York County, South Carolina
by: Ashley A. Peles and C. Margaret Scarry

Introduction

Archaeobotanical samples from the Ashe Ferry site (38YK533) present an opportunity to explore subsistence practices during a little known and poorly documented span of the Woodland period in the Piedmont region of the Carolinas. Because there are few (if any) precedent studies for Late Woodland period plant use in the central Piedmont, this study must rely on a wider regional context of plant use to situate the Ashe Ferry assemblage. Thus, the Woodland period in the Southeast is most broadly viewed as a time of elaboration of Late Archaic period trends, including increasing evidence for storage technology, widespread trade networks, more sedentary land use patterns, and the earliest indication of plant domestication (Gremillion 2003).. During both the Late Archaic and Woodland periods, husbandry was based on small grains, oily seeds, cucurbits, and greens in interior riverine areas. During the Middle Woodland period, people intensified the cultivation of starchy grains and larger oily achenes, including chenopod, maygrass, knotweed, little barley, sumpweed, and sunflower (Fritz 1993; Yarnell 1993). As the first clear evidence of year-round habitation is found during this period, it is perhaps unsurprising that some groups adopted farming economies based on native weedy cultigens (Gremillion 2003). The archaeobotanical record for the Middle and Late Woodland periods also evinces small quantities of maize, a MesoAmerican cultigen. However, isotopic analyses of human skeletal materials indicate that maize did not become a dietary staple until the Mississippian period (Johannessen 1993; Scarry 2003). While there was considerable temporal and regional variation in people's reliance on gathered and cultivated plants, arboreal nuts were important constituents in virtually all southeastern subsistence economies.

Methods and Materials

The 2010 investigations at 38YK533 recovered 291 catalogued botanical samples (12.3kg) from a wide variety of contexts. This analysis focuses on a subset of 32 samples derived from 16 discrete feature contexts, 12 of which are directly dated by AMS assay (Table 7.1; Figure 7.1). This subsample was specifically selected to reflect those contexts that contained the densest and most diverse arrays of food remains, and to represent the two feature types, deep storage pits and rock ovens, that predominate among documented facilities. Thirty of these botanical samples were recovered in the field from measured samples of feature matrix soils by flotation with a modified SMAP machine (conducted under direction of Mary Beth Fitts, UNC-CH). Sample extraction using the modified SMAP flotation tank utilized 1/32-inch mesh screens to catch the heavy fractions, while the light fractions were collected in cheese cloth bags and hung to dry. Once dry, the samples were bagged in polyethelene, labeled, and stored for future analysis. Light fractions from the selected features were submitted to the archaeobotanical laboratory at the Research Laboratories of Archaeology at the University of North Carolina, Chapel Hill for analysis. In addition to these flotation extracted samples, the analysis included one sample (2553eb2023) separated from waterscreened soils.

The 32 analyzed samples from the Ashe Ferry site (30 light fractions and 2 other samples) derived from approximately 451 liters of feature soil and weighed 3670.46 grams. Because the samples from seven features were particularly large (and apparently redundant in content), a

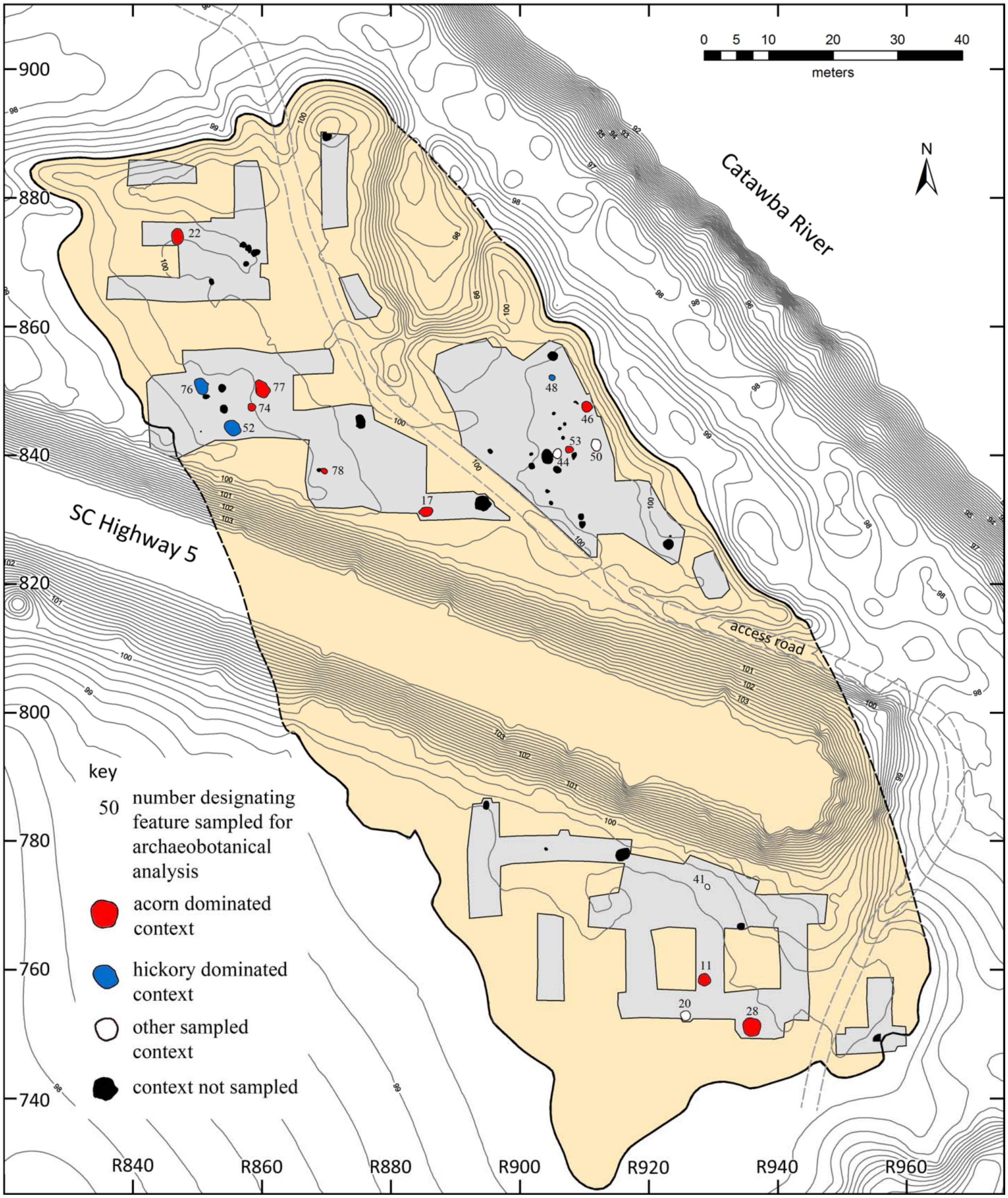

Figure 7.1. Plan of 38YK533 excavations indicating contexts sampled for archaeobotanical analysis.

riffle sorter was used to divide the samples into roughly equal portions of more manageable size, with each bag most commonly representing 1/16th of the sample. The aim was to scan roughly ¼ of the material from these contexts; 1125.37 grams (subsampled from the 3670.46g total) were ultimately analyzed. Sorting and macrobotanical analysis of these 1125.37 grams resulted in the recovery of 40,618 plant remains weighing a total of 358.63 grams, as well as 272.30 grams of wood charcoal. The remainder (494.44g) consisted of modern rootlets, sand, clay pellets and other detritus.

After subsampling and removal of detritus, analysis of plant material from the Ashe Ferry Site followed standard, widely accepted archeobotanical procedures. Light fractions were weighed and passed through a graded series of geological sieves (2 mm, 1.41 mm, .71 mm) to facilitate sorting. Plant materials greater than 2mm in size were sorted, identified, and quantified. All materials in the smaller sieve sizes were scanned; due to the large amounts of nutshell recovered in the 2mm sieve, only seeds were removed, identified, and weighed from the smaller sieves.

Identifications of seeds and non-wood plant material were made to the lowest taxonomic level possible. Primary characteristics used to classify materials were size, shape, and surface characteristics. Identifications were made through reference to pictorial seed manuals (e.g. Martin and Barkley 1961) and, when possible, confirmed by reference to a modern comparative collection. Material from nine features was partially sorted and analyzed in an archaeobotanical lab class conducted by C. Margaret Scarry. Ashley Peles sorted the remaining samples and made most identifications, and checked material analyzed by the class. C. Margaret Scarry identified or confirmed identifications of particularly difficult or unusual specimens. Unidentified plants were grouped into three categories: unidentified seed, unidentifiable seed, and unidentifiable. Remains categorized as unidentified seed are those for which taxonomic identifications were not determined. Unidentifiable seeds are fragments of or damaged seeds that lack the diagnostic characteristics necessary for identification. The "unidentifiable" category includes amorphous plant material that does not appear to be wood, but which lacks other diagnostic characteristics.

All nutshell fragments, seeds, and other plant remains are quantified by absolute count and weight; no attempt was made to estimate the actual number of nuts or seeds in the samples. Summary results of the analysis are presented in Tables 7.1-7.3 and Appendix F4; counts shown in each table are the numbers of specimens of each taxon. Table 7.1 lists the contexts from which the flotation samples were collected, providing information about the types of features, the number of soil samples and volume in liters for those samples, as well as the weight of plant and wood remains recovered. Plant weight is reported as the sum of wood remains in the greater than 2 mm fraction plus the weight of seed and nut remains from the sample. Table 7.2 provides the common and taxonomic names of the plants identified, indicates the seasonality of edible plants, and lists the number of specimens recovered from each category. Because the majority of plant remains recovered was acorn and hickory, Table 7.3 shows the distribution of those remains by feature. Appendix F4 presents analysis summaries of individual samples.

Results

Identification of specimens in the archaeobotanical samples from 38YK533 revealed that almost 98% (n=39796) of the non-wood plant remains recovered are nutshells or nutmeat; of the remaining 822 plant remains, 557 are pitch/pine sap, leaving only 265 charred crop seeds, fruit seeds, and other seeds in the sample (<1%). Such unevenness is particularly driven by the samples from Features 11, 17, 22, 46, 53, 74, 77, and 78, which yielded very high proportions of

Table 7.1. Flotation samples examined for botanical remains from the Ashe Ferry site.

Feature #	Feature Type	Phase Association	Soil Samples Analyzed	Liters Collected	Plant Weight (g)	Wood Weight (g)
11	storage pit	Ashe Ferry	1725	37.0	14.91	13.67
17	roasting facility	Ashe Ferry	1810	33.0	18.60	4.32
20	storage pit	Ashe Ferry	1885	21.5	5.84	5.78
22	roasting facility	Ashe Ferry.	1925	30.5	11.77	3.00
28	storage pit	Ashe Ferry	1978, 2001, 2018	129.0	74.12	48.45
41	shallow basin	Early Brown	2149	12.0	1.09	0.55
44	shallow basin	Ashe Ferry	2199, 2207, 2213, 2222	29.5	16.00	15.34
46	shallow basin	Ashe Ferry A.D.	2275	8.5	10.72	2.19
48	storage pit	Ashe Ferry	2299, 2320, 2313, 2333	31.5	13.75	11.15
50	basin (hearth?)	Ashe Ferry	2356	8.0	6.09	5.22
52	storage pit	Ashe Ferry	2414, 2417, 2429	9.5+	166.84	94.20
53	roasting facility	Early Brown	2448	7.5	10.74	3.97
74	roasting facility	Ashe Ferry	2711, 2727	21.0	22.77	5.56
76	storage pit	Early Brown & Ashe Ferry	275, 2771	8.5+	86.52	17.24
77	roasting facility	Ashe Ferry	2799, 2809, 2834	11.5	43.02	8.08
78	roasting facility	Early Brown	2844, 2850, 2855	52.5	59.94	28.48

acorn nutshell, and include approximately 96% of the total acorn shell recovered. With the exception of Feature 11 (a deep storage pit), these contexts with high acorn shell components are rock filled roasting facilities (Figures 7.2, 7.3). Another large deep pit (Feature 28) produced 70% of the acorn nutmeats from the site; many of these nutmeats were whole and none showed obvious weevil damage (in contrast to nutmeats recovered from rock ovens). The Feature 28 nutmeats include multiple acorn varieties, and a complete charred persimmon fruit was found mixed in with the nutmeats. Feature 28 deposits also yielded a flat stone with nutting depressions.

By contrast to the acorn-rich contexts, Features 52 and 76 exhibited very high proportions of hickory nutshell, while Features 44, 48, and 50 all have slightly elevated levels of hickory nutshell; these five features contain about 95% of the total hickory nutshell recovered. Each of these large, deep pits included very small quantities of acorn shell and few or no acorn meats.

Table 7.2. Plant taxa represented in analyzed samples from 38YK533.

Common Name	Taxon	Type	Count	Weight
Nuts				
Acorn	*Quercus* sp.	nutshell	24352	111.09
Acorn	*Quercus* sp.	nutmeat	2052	89.09
Hickory	*Carya* sp.	nutshell	13355	148.71
Hickory	*Carya* sp. cf.	husk frag	1	<0.01
Chestnut	*Castanea* sp.	nutshell	1	0.01
Walnut	*Juglans nigra*	nutshell	35	1.24
Fruits				
Blueberry	*Vaccinium* sp.	seed	2	<0.01
Bramble	*Rubus* sp.	seed frag	1	<0.01
Grape	*Vitis* sp.	seed	72	0.05
Maypop	*Passiflora incarnata*	seed frag	15	<0.01
Mulberry	*Morus rubra*	seed	1	<0.01
Persimmon	*Diospyros virginiana*	fruit	1	3.11
Persimmon	*Diospyros virginiana*	fruit frag	3	0.29
Persimmon	*Diospyros virginiana*	seed	24	0.60
Plum	*Prunus* sp.	seed frag	1	0.03
Plum/Cherry	*Prunus* sp. cf.	seed frag	2	0.01
Fruit skin cf.			1	<0.01
Starchy and Oily Seeds				
Bearsfoot	*Smallanthus uvedalis*	seed frag	5	0.01
Chenopod	*Chenopodium* sp.	seed	1	<0.01
Knotweed	*Polygonum* sp.	seed	3	<0.01
Little Barley	*Hordeum pusillum*	seed	4	0.01
Maygrass	*Phalaris caroliniana*	seed	11	<0.01
Sunflower	*Helianthus annus* cf.	seed frag	1	<0.01
Crops				
Maize	*Zea mays*	cupule	7	0.01
Maize	*Zea mays*	kernel	4	.03
Miscellaneous				
Flatsedge	*Cyprus* sp.	seed	1	<0.01
Holly	*Ilex* sp. cf.	seed	1	<0.01
Holly	*Ilex* sp.	seed	1	<0.01

Table 7.2. (continued).

Common Name	Taxon	Type	Count	Weight
Legume	Fabaceae	seed frag	1	<0.01
Pokeweed	*Phytolacca* sp.	seed frag	3	<0.01
Purslane	*Portulaca* sp.	seed	34	<0.01
Sedge	Scirpus/Carex	seed	1	<0.01
Sedge	Cyperaceae	seed	2	<0.01
Spurge	Euphorbiaceae	seed	11	<0.01
St. Johnswort	Hypericum sp. cf.	seed	1	<0.01
Weedy legume	Weedy legume	seed	2	<0.01
Grass Node	Poaceae		1	<0.01
Pine	*Pinus* sp.	cone frag	1	0.04
Pine	*Pinus* sp.	cone/scale	41	0.14
Pitch	Pitch		515	4.08
Unidentified seed		seed/seed frag	4	<0.01
Unidentifiable seed		seed/seed frag	6	<0.01
Unidentifiable			37	0.08

Table 7.3. Nut remains by feature from Ashe Ferry site.

Feature	Feature Type	Acorn	Acorn Meat	Hickory	Total
11	Large Circular Pit	218	21	17	256
17	Rock Oven	3115	19	26	3160
20	Large Circular Pit	8	0	1	9
22	Rock Oven	1945	43	35	2023
28	Large Circular Pit	266	1317	56	1639
41	Ovoid Basin	22	0	15	37
44	Ovoid Basin	8	1	56	65
46	Ovoid Basin	1509	14	164	1687
48	Ovoid Pit	14	0	183	197
50	Large Oval Pit	5	0	77	82
52	Large Oval Pit	463	8	7858	8329
53	Rock Oven	1386	52	64	1502
74	Rock Oven	3166	53	115	3334
76	Large Oval Pit	74	1	4378	4453
77	Rock Oven	7143	126	237	7506
78	Rock Oven	5010	397	74	5481
Totals		**24352**	**2052**	**13356**	**39760**

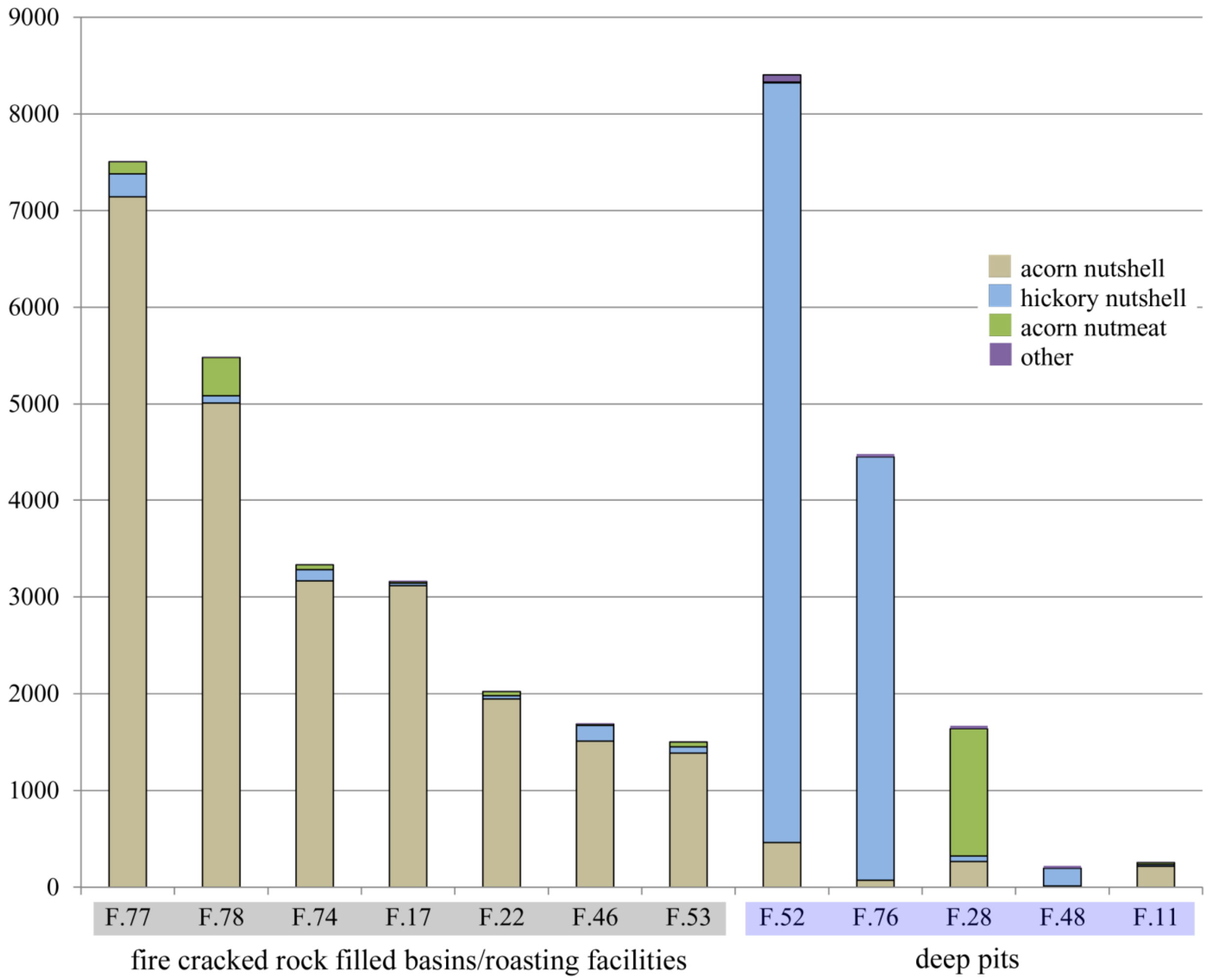

Figure 7.2. Chart illustrating differential distribution of plant food residues (by count in subsample) in roasting facilities vs. deep pits. Samples displayed include >200 identified specimens.

Differential distributions of acorn nutshell, acorn nutmeat, and hickory nutshell appear to map specifically onto feature type, and the disposal modes associated with particular feature types (see Chapter 4 discussion). Rock-filled roasting facilities, which yielded the vast majority of acorn nutshell fragments, appear to have been abandoned without subsequent trash disposal, and nutshell fragments represent *de facto* residues from primary facility function (i.e., roasting acorns). By contrast, the burned nutshells and nutmeats recovered from storage pits likely do not reflect primary stored contents, but rather secondarily disposed refuse deposited after the original stored foods had been removed. Significantly, patterns of nut fragment distribution appear stable throughout the primary occupations of the site, that is, complementary distributions of acorn nutshell, acorn nutmeat, and hickory nutshell in roasting facilities and pits are evident in both Ashe Ferry phase and Early Brown phase components. In addition, the spatial distributions of these feature types (and their associated contents) exhibit continuity across the Ashe Ferry phase and Early Brown phase components (see Chapter 4). Roasting facilities tend to be located in a linear pattern along the terrace backslope parallel to the terrace crest, while deep pits tend to be situated in finer grained sediments farther down the backslope.

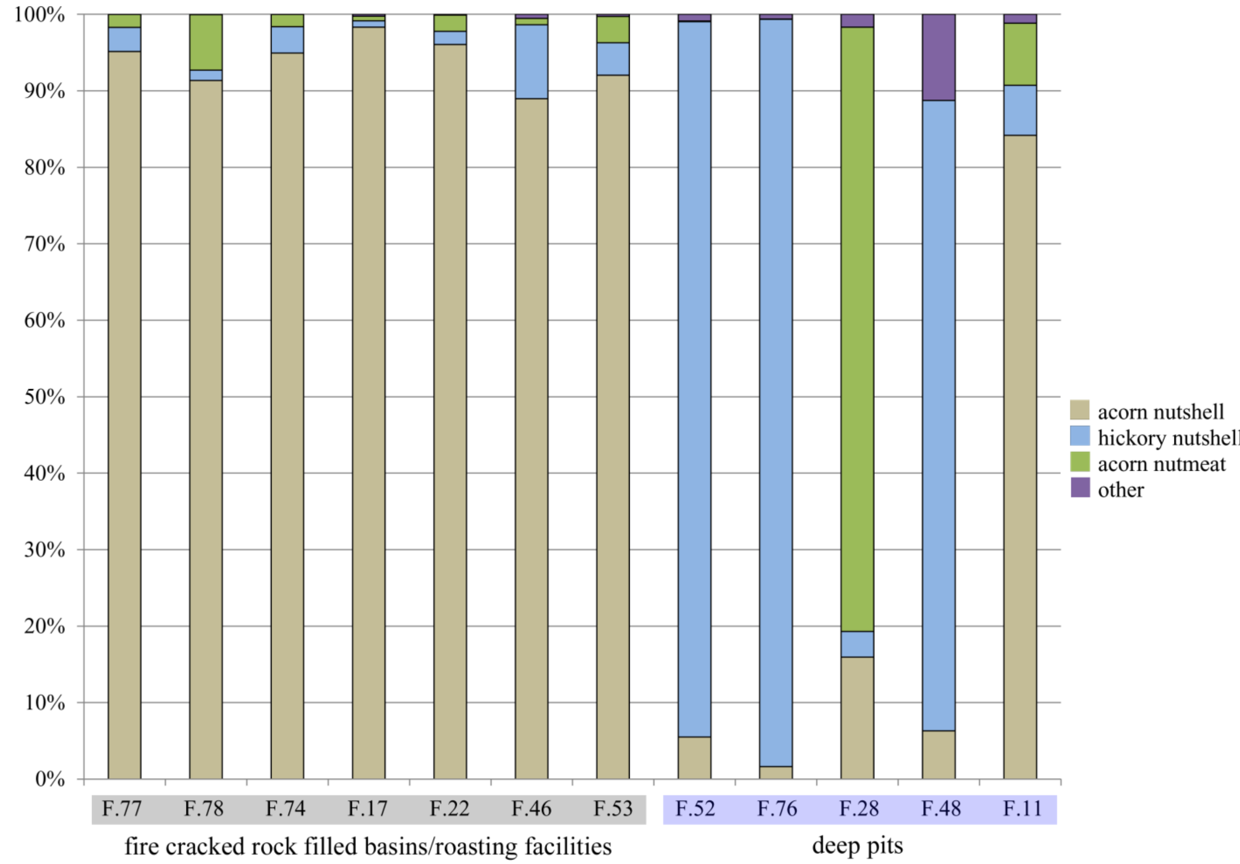

Figure 7.3. Chart illustrating differential distribution of plant food residues (percentage of identified specimens) in roasting facilities vs. deep pits. Samples displayed include >200 identified specimens.

Other food remains, such as fruit seeds and seeds of cultivated crops, exhibit no obvious spatial or temporal patterning, and appear to be evenly distributed across feature types. The relatively low incidence of these foodstuffs in all contexts, in contrast to the extremely high incidence of arboreal nut remains, is most consistent with interpretation of site occupations as largely seasonal, short term encampments focused on specific resource extraction. The plant remains point to use of the camp as a base for gathering, processing, and perhaps storing nuts, especially acorns. These were likely primarily women's activities; men accompanying the women may have fished or hunted deer and other animals attracted to the fall mast.

Feature Assemblages

Feature 11

Feature 11, an Ashe Ferry phase storage pit (AMS date, ca. A.D. 1030) with multiple zones of fill, included a single basal stratum interpreted as an intentionally dumped deposit (Zone C). This zone contained dense charcoal inclusions, as well as moderate amounts of potsherds and fire-cracked rock, a point and debitage, as well as a possible milling stone fragment. Thirty-seven liters of soil collected from Zone C yielded a botanical sample of 131.74g; this light fraction was subsampled and 35.39g of the sample was analyzed. Acorn shell (n=218) and acorn nutmeat (n=21) were the predominant materials recovered from this subsample (although not in numbers as large as in other features), with a smaller amount of hickory (n=17) and a low incidence of other plant material (persimmon, blueberry, pine/pitch).

Feature 17

Feature 17, an Ashe Ferry phase rock oven/roasting facility, contained 60 fire-cracked rocks but relatively few artifacts. The cluster of fire-cracked rock within the feature basin is interpreted as the disturbed remains of a roasting facility that was largely cleaned out after firing. Thirty-three liters of soil collected from Zone A yielded an archaeobotanical sample of 79.67g; this light fraction was subsampled, and approximately 22.6g of the material was ultimately analyzed. The Feature 17 subsample contained large quantities of acorn nutshell (n=3115), with much smaller amounts of acorn nutmeat (n=19) and hickory nutshell (n=26), as well as a small amount of maygrass (n=6), a maize cupule, and pitch.

Feature 20

Feature 20 was a large Ashe Ferry phase pit with two distinct depositional zones. Zone A included the majority of debris, which included animal bone, daub, flakes, fire-cracked rock, shell, potsherds, and a re-worked stone pipe bowl. Zone B had fewer artifacts, but contained isolated human skeletal material that may have been incidental to redeposited soils dumped into the base of Feature 20. Soil samples (21.5 liters) taken from Zone A yielded on 23.94g of botanical material for analysis. This scant sample included fragments of acorn nutshell, hickory nutshell, knotweed, purslane, mulberry, and pitch/pine.

Feature 22

Feature 22, an early Ashe Ferry phase roasting facility, was a large, shallow basin with sparse fire-cracked rock and artifact content. AMS assay of carbonized nutshell from this facility yielded multiple widely aberrant dates (4300-900 years BP) that were inconsistent with the context and assignment to the early Ashe Ferry phase is based upon inclusions of Ashe Ferry Simple Stamped sherds and Cape Fear Fabric Impressed sherds (a combination not observed in other well dated Ashe Ferry phase contexts). A 30.5l soil sample from Zone A produced approximately 173.5g of flotation separated plant remains; 36.79g of this sample was included in the analysis. This subsample proved replete with acorn nutshell (1945 fragments; 52.87 acorn nutshell/gram), and included smaller amounts of acorn nutmeat (n=43) and hickory nutshell (n=35), as well as a very small amount of chenopod, little barley, purslane, spurge, and pitch.

Feature 28

Feature 28 was a large, late Ashe Ferry phase (AMS dated ca. A.D. 1160) pit that yielded numerous charred acorn nutmeats. Feature matrix Zones A and C included masses of charred mast that may represent separate disposal events, or may simply reflect separate lenses of "over-roasted" nuts differentiated within a single depositional episode. Approximately 68.5 liters of Zone A soils yielded 346g of botanical material; one-third of which was analyzed. This sample is dominated by acorn nutmeats (n=501; 4.74 nutmeat/gram), with much smaller amounts of acorn (n=120; 1.28/gram) and hickory nutshell (n=37; 0.45/gram); small amounts of walnut shell, persimmon, grape, and pine/pitch were also present.

Sixty liters of soil from Zone C produced a flotation extracted botanical sample of 162.36g. This sample was subdivided in the laboratory, to effect a one-fourth subsample for analysis.

This subsample proved even more heavily dominated by charred acorn nutmeats (n=816; 14.49/gram), again with lesser amounts of acorn nutshell (n=289; 3.35/gram) and hickory nutshell (n=21; 0.30/gram). The only other identifiable plant remains from Zone C were persimmon seeds. In addition to the flotation sample from Zone C, investigators hand recovered a bagful of carbonized mast from this stratum. The hand recovered sample (72.98g) contained 279 nutmeats, many of which were complete halves; differing morphologies among these nutmeats indicate the presence of two or more species of acorns. Mixed in with the nutmeats was a complete charred persimmon fruit.

Feature 41

Feature 41, a small truncated storage pit, dates to the Middle Mississippian period Early Brown phase. An AMS derived date of 630±30 yrs BP for Feature 41 is calibrated to 2 σ range of AD 1280-1400, with calibrated curve intercepts of A.D. 1300, A.D. 1360, and A.D. 1380. Flotation processing of twelve liters of soil from Feature 41 produced a sample of 50.06g approximately half of which was analyzed; after cleaning, this sample yielded 1.64g of archaeobotanical material. Both acorn (n=22) and hickory (n=15) nutshell were identified in the subsample, as well as a maize cupule and pitch fragments.

Feature 44

Feature 44, a shallow basin associated with Ashe Ferry phase site occupations, contained relatively sparse refuse deposits with low archaeobotanical content. Analysis of samples from this context aimed to determine whether the archaeobotanical profiles of low density contexts differed substantially from those of obvious high density contexts. Flotation processing of 29 liters of soil from Feature 44 produced 37.6g of light fraction; sorting reduced this to 29.5g of archaeobotanical material. Analysis of this sample revealed small amounts of acorn (n=8) and hickory (n=56) nutshell and pitch. Other minor constituents of this sample include walnut shell, purslane and spurge.

Feature 46

Feature 46 was a shallow ovoid basin with two layers of fill, an upper zone with Early Brown phase and Ashe Ferry phase ceramic sherds, and a lower zone that contained only Ashe Ferry ceramic sherds. AMS assay of carbonized material from the lower zone produced a radiocarbon date of 1000±30 yrs BP (2σ ranges [calibrated], AD 990–1140, A.D. 1100–1120, A.D. 1140–1150), indicating an Ashe Ferry phase aged deposit. An 8.5 liter flotation sample taken from Zone A (a presumed Early Brown phase deposit) produced large quantities of acorn nutshell (n=1509; 57.66/gram). Other plant materials recovered included acorn nutmeat, hickory and walnut shell, bramble, maygrass, sunflower, and pitch.

Feature 48

Feature 48 was a late Ashe Ferry phase (AMS 910±30 yrs BP; 2σ range [calibrated], A.D. 1030–1210) storage pit situated on the terrace crest in the main residential area of the site. A total of 14.5 liters of soil were collected and processed from Zone A; this fill did not contain a large amount of material, with hickory nutshell (n=183) being the most prevalent plant material recovered. Smaller amounts of acorn nutshell (n=14) were also recovered, along with a number of grape (n=21), maypop, maygrass, spurge, purslane, sedge and pitch remains.

Feature 50

Feature 50 (AMS 1000±30 yrs BP; 2σ ranges [calibrated], A.D. 990–1140, A.D. 1100–1120), a probable hearth, was a large shallow basin with two smaller pits (Zones A and B) that may have been sconces for ceramic vessels used for cooking or food processing. One of these smaller pits included two large, vertical sections of an Ashe Ferry Simple Stamped jar (approximately one third of the vessel) that rested above quartz cobbles. Analysis of the flotation extracted botanical sample associated with this vessel section identified hickory nutshell (n=77; 4.14/gram), as well as acorn nutshell (n=5), little barley (n=2), maize cupules (n=3), sedge, purlane, and pine/pitch.

Feature 52

Feature 52 was a large Ashe Ferry phase pit (AMS 970±30 yrs BP; 2σ range [calibrated], A.D. 1010–1160), probably used for storage or food processing before abandonment and filling. Flotation processing and waterscreen sorting of Feature 52 soils recovered 1342.1g grams of material. This sample was subsampled for analysis, and 347.91g were subject to identification. Hickory nutshell (n=7857; 22.59/gram) was the primary archaeobotanical constitutent in this context, along with a moderate amount of acorn nutshell (n=463; 1.33/gram), as well as acorn nutmeat, walnut shell, grape, maypop, persimmon, bearsfoot, little barley, maize kernels, flatsedge, holly, knotweed, and pitch. Feature 52 produced 61% (n=43) of the grape seeds and 87% (n=13) of the maypops seeds identified from the site.

Feature 53

Feature 53 was a roasting facility filled with fire-cracked rock that included both Ashe Ferry phase and Early Brown phase materials (associated AMS dates: 1010±40 yrs BP, 920±30 yrs BP). A 7.5 liter soil sample from this context produced a botanical sample of 24.38g, and revealed an assemblage dominated by acorn nutshell (n=1386; 56.85/gram). Other plant materials identified in this sample include acorn nutmeat (n=52), hickory nutshell (n=64), grape (n=2), a maize cupule and a maize kernel fragment.

Feature 74

Feature 74, an Ashe Ferry phase fire-cracked rock filled roasting facility, produced archaeobotanical samples of 84.5g from flotation processing of 21 liters of soil. These samples included 3166 acorn nutshell fragments (38.74 fragments/gram), 53 acorn nutmeat fragments, 115 hickory nutshell fragments, as well as bramble (e.g. blackberry), bearsfoot, maygrass, purslane, spurge, and St. Johnswort seeds.

Feature 76

Feature 76 was a large storage pit that included both Ashe Ferry phase and Early Brown phase deposits. Radiocarbon dates for the Early Brown phase deposit indicates an early thirteenth century date (AMS 840±30 yrs BP; 2σ range [calibrated], A.D. 1160–1260). Hand recovery and flotation extraction obtained archaeobotanical samples totaling 1481.38g of materials from this feature. Analysis focused on the Early Brown phase deposits (Zones 1 and 2), which yielded 487.88g of botanical materials. Identifications from a subsample of 141.25g of plant remains revealed an assemblage dominated by hickory nutshell fragments (n=4378; 34.35 hickory nutshells/gram) with far lesser amounts of acorn nutshell (n=74), acorn nutmeat and walnut nutshell (n=15). Seeds from these deposits include grape, maypops, persimmon, plum/cherry, holly, pokeweed, and purslane.

Feature 77

Feature 77 was a fire-cracked rock filled roasting facility associated with Late Woodland Ashe Ferry phase site occupations (AMS 1040±30 yrs BP; 2σ range [calibrated], A.D. 970–1030). Thirty-five liters of soil from Feature 77 produced botanical samples totaling 178.41g, of which 104.7g were analyzed. The subsample was dominated by acorn nutshell (n=7143; 68.22/gram), along with acorn nutmeat (n=126), and hickory nutshell (n=237). The subsample also contained a maize cupule, along with bearsfoot, purslane, and spurge seeds.

Feature 78

Feature 78, a fire-cracked rock filled pit, appears to have been a more formal cooking facility than other rock ovens or roasting facilities documented at 38YK522. Ceramic sherd associations and derived radiocarbon dates (AMS 750±30 yrs BP; 2σ range [calibrated], A.D. 1230–1290) indicate use of the facility during the Early Brown phase. Flotation processing of 52.5 liters of feature soil recovered 551.45g of plant material, of which a 101.08g subsample was selected for analysis. This subsample consisted mainly of acorn nutshell (n=5010; 35.49/gram), along with acorn nutmeat (n=397), and hickory nutshell (n=74). Also present were walnut nutshell (n=1), a plum pit fragment, a maize kernel, a spurge seed, and carbonized pitch.

Discussion of Plant Remains from 38YK533

The analysis of archaeobotanical samples from the Ashe Ferry site identified exceptionally high frequencies and relative proportions of acorn remains (n=26,404 specimens) and hickory nut remains (n=13,356 specimens); these nut fragments account for more than 99% of identified specimens by count and more than 98% by weight. Other food species (e.g., maize, grape, walnut, persimmon, maypops, blackberry, maygrass, knotweed, little barley, bearsfoot, pokeweed, blueberry, holly, plum/cherry, amaranth, chestnut, chenopod, legume, morning glory, mulberry, plum, sunflower) appear in trace quantities and illustrate possible dietary breadth, but the assemblage as a whole clearly indicates a specialized activity focused on the gathering, processing and storage of nuts. Therefore, the following discussion emphasizes the role of arboreal seeds/nuts in pre-Columbian diets, and examines ethnographic data for activities that produce nut residues comparable to those documented at 38YK533.

Nuts

The vast majority of identified plant remains from the Ashe Ferry site are fragments of acorns (*Quercus* sp.) and hickory nuts (*Carya* sp.). Most of these are nutshell fragments, although smaller amounts of acorn nutmeat were found in a number of features, and one feature (Feature 28) contained masses of acorn nutmeat. In most instances (with the exception of the Feature 28 sample), acorn nutmeats included fragments with weevil damage, a possible reason for their discard. Both hickory and acorn are common taxa found throughout Eastern Woodlands sites; insofar as we know, nuts were the most important wild plant foods for most Native American peoples of this region. Small amounts of black walnut (*Juglans* nigra) and one fragment of chestnut (*Castanea* sp.) were recovered as well.

Acorns dominate the overall assemblage, with both nutmeat and nutshell fragments recovered from most of the analyzed features. Acorns are well documented in the southeastern archaeological record, and appear to have been a major food source for southeastern native peoples throughout much of the Holocene epic (Hollenbach 2009; Messener 2011; Scarry 2003). Various types of these arboreal seeds are plentiful across many southeastern environmental settings, and constitute a lynchpin of southern hardwood forest ecology as the mainstay mast crop for a wide range of mammals, birds, and insects.

Acorns are a particularly good source of carbohydrates (55%), and exhibit relatively high fat content (10%-30%), but low protein content (7%) (USDA 2013). In terms of nutritional values, they compare favorably to pre-modern cultivated grains such as maize and wheat, and returns for time/labor investments for acorn procurement and processing appear comparable to those of cultivated grains produced in pre-modern horticultural regimes.

Balanophagy (acorn diet) by humans is a world-wide phenomenon, and is well documented in North America, Europe, southwest Asia and east Asia (Mason 1992; Mason and Nesbitt 2009), with human use ranging from dietary staple to famine exigency food. Balanophagy and the human ecologies related to acorn use are particularly well documented for historic-era native populations of central California, where acorns constituted a crop-like staple food (Barrett and Gifford 1933; Basgall 1987; Driver 1952; Meyer 1976; McCarthy 1993; Ortiz 1991). Studies of acorn use by native peoples of California provide analogic models for much of the following discussion of acorn gathering, processing, storage and consumption by the Ashe Ferry phase and Early Brown phase inhabitants of 38YK533.

Although specific acorn types represented at 38YK533 are not identified, multiple species (with potentially different processing requirements) are clearly represented. Oaks (*Quercus* sp.) are divided into two broad superspecific/subgeneric groups, white and red, of which red oak acorns require special processing to remove tannic acid. Depending on the species, oaks produce heavy mast in cycles that vary from two to three years. The cycles result from a combination of genetic control and weather conditions in such a way that entire regions are on the same cycle. Acorns ripen over a period of several weeks; red oak acorns begin to ripen in late August in the Carolinas, while white oak acorns ripen and fall in September. The acorns must be collected quickly when they fall; the nuts are favored by many animals and delay in harvesting can mean a significant loss of acorn mast to deer, turkey, squirrels, bears and other mast foraging species. To reduce such loss of fallen acorns to ground-feeding animals, human collectors often use poles to knock nuts from branches to concentrate acorns for immediate collection (Mason and Nesbitt 2009; Ortiz 1991). Immediate (rather than delayed) collection also secures acorns from germination, mold and insect damage. Experienced gatherers select sound nuts in the field, and judge acorns by heft, texture of the shell, and the presence of holes discarding those that are moldy or weevily (Anderson 2005).

Once collected, acorns can be processed immediately for consumption, or may be prepared for storage. Drying is essential if people intend to store acorns (Messner 2011), but even those nuts that are going to be eaten immediately are dried to facilitate cracking. From an optimal foraging perspective, Bettinger et al. (2007) argue that drying reduces weight and hence transport costs and therefore should be expected to take place at the collection site even when groves are close to home. California native women dried unshelled acorns in the sun by spreading them out in a single layer on mats or fabric, periodically turning or stirring the nuts to promote even drying (Ortiz 1991). During this drying process, spoiled or infested nuts were culled and discarded. Ethnohistoric accounts from the Southeast indicate that acorns were parched on mats or in shallow baskets on hurdles over a low fire, a process that dried acorns, prevented sprouting, killed insect infestations, and reduced mold problems (Kupperman 1988).

After they are sundried or parched, nuts intended for storage must be kept dry and protected from rodents. Colonial accounts from the Southeast report that acorns were stored in baskets within homes and in "hovels", which we interpret as granaries (Lederer 1672, Lawson 1709). While there are no references to storage pits in the ethnohistoric literature for the southeastern United States, pit storage of acorns is well documented in the Northeast, the Great Lakes region, and the Northwest Coast (Dunham 2009; Heath 1963; Mathews 2009).

Native Californians typically stored acorns in their shells (Ortiz 1991). Similar practices may have been present in the Southeast, but there is archaeological evidence that acorns were frequently (de)shelled before storage. Hollenbach (2009) reports that over 5000 charred nutmeats with minimal associated shell were recovered from the Stanfield-Worley rockshelter in Alabama. More telling is the Turner site in Missouri, where sizeable quantities of stored foods were charred (and thus, preserved) when the village burned. Five of the Turner houses had large stores of shelled acorn meats (Scarry nd). The length of time people expected to keep their nuts may have been the determining factor in whether they stored their acorn harvest in the shell or husked. The shelf-life of acorns is longer if they are stored unshelled; thus, people may have shelled nuts they planned to use soon and left those they intended for long term storage unshelled.

All acorns must be shelled and the thin skin that encases the meat must be removed before human consumption. Acorns can be shelled using a mortar and handstone to crack the nuts or by using a knife or flake to slice through the shell. The skin around the nutmeat can be removed by hand rubbing and winnowing or the skin can be peeled off with a sharp implement (Jackson 1991; Ortiz 1991).

Bitter acorns from the red oak group must also be leached or have their tannins reduced by other means. There are a variety of techniques for extracting tannins; which one a cook employs may depend on how the nuts will be prepared. If acorn flour is to be made into bread or porridge, the meats are pulverized using a rock or wooden mortar and pestle. The flour can then be leached by repeated rinsing in water—cold is preferred because hot water extracts oil as well as tannins. In California, women made shallow sand basins to leach their flour. Shelled meats may also be leached by placing them in bags or baskets in flowing water. If nutmeats are to be added to soups or stews, the tannins can be extracted by boiling the meats for half a day, changing the water several times during the process. An alternative to such prolonged boiling is to neutralize the tannins by adding ashes or lye when the nutmeats are cooked (Kupperman 1988; Jackson 1991; Ortiz 1991; Messner 2011).

Ethnohistoric accounts of southeastern native peoples indicate use of acorn flour, addition of acorn nutmeats to stews, roasting of whole acorns for direct consumption, and extraction of acorn oils or acorn butter (Gardner 1997; Lawson 1709; Waselkov and Braund 1995). Sweet (i.e., white oak) acorns did not require much (or any) processing to remove tannins, and could be roasted and eaten after peeling. Acorn oil extraction probably used oilier, but bitter, red oak acorns that were first leached with cold water rinses to remove tannins without flushing oils. Because acorns are relatively low in fats (i.e., 14%–25%), rendering acorn oil or production of acorn butter was a time consuming process (Petruso and Wickens 1984; Scarry 2003).

California native women often shelled, peeled, leached and cooked acorns as they were needed or kept batches of nuts at various stages of processing. (Jackson 1991). This spreads out the work load and results in smaller quantities of acorn shell being discarded at any one time. Such on demand processing, however, forfeits efficiencies of scale that can be obtained by processing larger batches than are needed for immediate use. In the Southeast, small quantities of acorn shells are common constituents of many archaeobotanical samples but features with large amounts of shell or meat are also found (Scarry 2003 and references therein). This suggests people employed both on-demand and large-batch processing depending on scheduling and processing needs.

Acorn remains recovered from contexts at 38YK533 likely represent multiple processing steps. Nutshell fragments are primarily concentrated in fire-cracked rock filled roasting facilities, and appear to be *de facto* residues from roasting acorns in these facilities. When moisture in parching acorns reaches the boiling point, released steam frequently causes the shells (particularly those of sound acorns) to crack or pop, and detach fragments of shell that might be charred *in situ*. Relatively low temperatures (≈250°–350°F) on the surfaces of these facilities would have promoted charring rather than complete combustion of acorn shell. By contrast, burned acorn nutmeat fragments are concentrated in large, deep pits in trash-filled deposits. These nutmeats appear to represent secondary discard deposits, materials charred in hearths (or on roasting facilities), then transported with hearth debris and dumped into abandoned storage pits.

Within the same family as oaks are chestnuts, of which there are two varieties: the American chestnut (*Castanea dentata*.) and chinquapin (*Castanea pumila*). Until the chestnut blight in the early 20th century, chestnut trees were distributed throughout the piedmont areas of the Southeast. Chestnuts ripen in the fall, when the prickly burs split open and release the nuts. Unlike acorn, hickory, and walnut, chestnuts produce a reliable mast crop every year. The nuts are thin shelled and sweet, and were prized by humans and animals alike. Like acorns, chestnuts are primarily a source of carbohydrates, with relatively low fat and protein contents. Processing and cooking of chestnuts appears to have followed along the same lines as sweet acorns, with consumption encompassing a large range of possibilities: eaten raw, pounded and boiled, and ground for meal to make bread. Despite the fact that chestnuts appear to have been quite important ethnohistorically, the relative fragility of their husks has meant that there is very little archaeobotanical evidence for their importance (Scarry 2003). The single instance of chestnut shell at 38YK533 is unique in central and eastern South Carolina, and illustrates the presence (but not importance) of this resource.

Hickory (*Carya* sp.) nutshells (n=13,356) are the second most abundant identified plant remains at the Ashe Ferry site, and are present in all analyzed samples. The carbonized stony shells are robust, and typically survive at much higher rates than other archaeobotanical remains. Hickory nuts are ubiquitous in the southeastern archaeological record, and clearly constituted an important food resource for southeastern native peoples throughout much of the Holocene epic (Hollenbach 2009; Scarry 2003). Hickory nuts are a particularly good source of fats (64%) and moderate amounts of protein (13%), but lack certain critical amino acids (Talalay et al. 1984:343, 350). Hickory nuts are a relatively poor source of carbohydrates (18%) and dietary pairing with acorns has a complementary effect (Scarry 2003:60, 66; USDA 2013).

Hickory trees are typically found in groves in mixed hardwood forests, and are often co-dominant with oaks (Braun 1950). Four hickory species (shagbark, mockernut, big shellbark, and sand) were likely most important to native peoples in the South Carolina piedmont (Scarry 2003:57, 60). Shagbark hickory (*Carya ovata*) is more commonly found on upland slopes and in rich woods. It is the fastest growing of the hickories and is resistant to insects and disease, but is susceptible to fire. Mockernut hickory (*Carya tomentosa*) is found mainly on ridge and hillside sites and less commonly on alluvial bottoms, and is very susceptible to fire and insect damage. Shellbark hickory (*Carya laciniosa*) favors fertile, moist soil, and is usually found on the alluvial floodplains of major streams. This species is susceptible to insects and frost damage. Sand hickory (*Carya pallida*) is found in dry, sandy soil, often mixed with pines on upland slopes (Talalay et al. 1984:338-339).

In view of the dietary and economic importance of hickory nuts, native populations may have managed nut groves by girdling undesirable trees to thin the canopy and burning undergrowth to kill saplings and create open woodland. Such management practice would have increased nut production and lessened competition from squirrels (Fritz et al. 2001:5). In experiments done by Talalay et al. (1984), shagbark hickories in open growth areas averaged 9.5 pounds of nuts per tree in a season, compared to 2.2 pounds of nuts per tree in closed canopy forest.

Hickory nut production is cyclical and varies according to weather conditions. Hickory trees typically produce heavy crops every two to three years, with lighter crops in between. Trees within a grove are usually on the same cycle. Hickory nuts ripen in the fall, and are fully mature in October in the Carolinas. When the nuts are ripe, the outer husks dry and split open, releasing the nuts onto the forest floor. Predicting hickory mast production and scheduling collection to take best advantage of an abundant crop is particularly important due to competition by other mast consuming animals (Scarry 2003:60).

The maximum fall of hickory nuts is near the end of October, about one to two weeks after the first killing frost, although the collecting period extends into late November (Talalay et al. 1984:341-342, 344-345). Due to competition with other animals, people have to harvest hickory trees within a week or two after the nuts drop. As long as the nuts are quickly gathered, it is fairly easy to rapidly amass a large amount (Scarry 2003:60); experiments indicate that shagbark hickory nuts can be collected at a rate of about 11.0 lbs of dry nuts per hour, while mockernut hickory nuts can be collected at a rate of roughly 6.1 lbs per hour.

Hickory nuts can be collected in bulk and stored for later use; as long as they are dry and protected from rodents, the unshelled nuts keep for extended periods of time. Rendered hickory oil, in solid form (*kenuche*), has a much shorter storage lifespan (Scarry 2003:61). Hickory nuts have smooth, dense stony shells that are notoriously tough to crack. Because convoluted hickory nutmeats are difficult to remove from their shells, any large scale consumption necessitates mass processing techniques. Ethnohistoric descriptions from the southeastern United States indicate that hickory nuts were mainly collected and processed for oil or hickory milk (Scarry 2003:60-61). The first stage of nut processing was extraction, which was typically effected by placing individual nuts on a large, flat stone anvil and cracking them with a smaller, handheld hammerstone. If the nut is hit correctly, it splits in half, facilitating kernel extraction with a knife or nutpick. To aid in this process the nuts are first dried, causing the nutmeats to pull away from the shell (Talalay et al. 1984:351-352). Even with drying, pieces of the nutshell will remain in the kernel, and the amount of nutmeat procured for such an effort is not very high.

Mass processing of nuts for hickory oil or milk, without regard for condition of the nutmeats is a much easier and quicker process. Simultaneous cracking (and crushing) of multiple nuts using large wooden mortars and pestles sped extraction. After hand removal of larger fragments of crushed nutshell, hickory nutmeats and attached nutshell were further pulverized into a meal-like consistency (similar to cornmeal) (Fritz et al. 2001:11-13). This hickory meal can then be consumed directly; the nutmeat, composed of fat and protein, would dissolve in the mouth, and most nutshell fragments could be spit out (Talalay et al. 1984:354).

Further processing (in lieu of immediate consumption) might involve production of *kenuche,* hickory oil, or hickory milk. *Kenuche*, a mixture of semi-rendered hickory nut fats with hickory meal and residual nutshell that can be formed into hardened cakes or *kenuche* balls and stored for later use. *Kenuche*, which present-day Oklahoma Cherokees still produce, is typically used as an ingredient for soups or stews. To produce *kenuche*, the hickory meal is pounded until the fats begin to release and the mixture can be formed into a ball that keeps fresh for several days (Fritz et al. 2001). Because the hickory meal is immediately formed into a ball, small pieces of hickory shell are still present. To cook, the kenuche balls are placed in a vessel and boiling water is poured over them, with the mixture stirred constantly. This causes the proteins and fats from the nutmeat to combine with the water to form a milky broth; the remaining nutshells sink to the bottom (Fritz et al. 2001).

If hickory oil or milk was the desired product, hickory meal was further processed with either cold water or boiling water to extract oils. In the simplest method, cold water is added to the hickory meal, agitated, then decanted and strained to produce "milk." The second method was similar, but involves boiling the mixture before skimming or decanting the oil. The boiling technique has a much higher yield than attempting to pick the meats out by hand; the product of 1000 grams of crushed nuts can be boiled off in ten minutes (Talalay et al. 1984). Pulverized nuts or hickory meal are added to slowly boiling water, and the bulk of the oily portion of meats eventually separate and rise to the surface, to be skimmed off. The nutmeats dissolve into a milky emulsion in the water, the fluid of which can be poured through a strainer to remove the nutshell. The rendered oil (hickory butter) can be stored for later use, while the "milk" can be drunk or used as stock.

Black walnuts (*Juglans nigra*), a relative of hickories, are present in small numbers (35 shell fragments) in the 38YK533 samples. These bottomland trees typically grow singly or in low density groves, and produce abundant nut crops on two-three year cycles. Compared to the other edible nuts, walnuts are the best source of protein (24%), as well as being high in fats (59%) and low in carbohydrates (10%) (Talalay et al. 1984). Most southeastern ethnohistoric accounts indicate the nutmeats were eaten as a treat, or added to grain dishes or cakes (Talalay et al. 1984:354). Extracting black walnut oil is difficult because the tannin-filled husk adheres to the rugose shell, preventing mass processing in the same fashion as hickory nuts (Scarry 2003; Talalay et al. 1984). Therefore, black walnuts were likely processed by cracking individual nuts, and manually extracting nutmeats. The relative paucity of walnut shell at 38YK533 likely reflects both low densities of black walnut in the local environment and the difficulties in processing this high quality, but low yield food

Fruits

Fleshy fruits are represented in low numbers in the 38YK533 archaeobotanical assemblage. They do not appear to have been major dietary components for the occupants of the Ashe Ferry site, but fruit may have added variety to the diet or contributed to the native pharmacopeia (Williams 2000). Fleshy fruits can be eaten raw, added to stews and soups, or added to composite foods such as pemmican. They can also be dried and stored for winter use, with some, notably persimmon, being made into bread (Scarry 2003).

Fruit seeds recovered from the Ashe Ferry site include blueberry (*Vaccinum* sp.), blackberry (*Rubus* sp.) grape (*Vitis* spp.), maypops (*Passiflora incarnata*), mulberry (*Morus rubra*), persimmon (*Diospyros virginiana*) and plum (*Prunus* sp.). These fruits thrive in areas of human disturbance, and were probably available in the immediate environs of the Ashe Ferry site. Most of these fruits are available for collection throughout the growing season, except persimmons, which ripen in the fall (Scarry 2003). All of these fleshy fruits are low in proteins, and fats, but may have contributed essential vitamins and minerals to native diets. In addition, blueberries and grapes have numerous medicinal uses (Moerman 2003), including tannic properties of the leaves effective in treating diarrhea, thrush, and kidney problems (Williams 2000). The bark and unripe fruits of persimmon are also used in medical preparations to treat sore throats, toothaches, stomachaches, and diarrhea (Williams 2000).

Starchy and Oily Seeds

Six species of starchy or oily seeds were recovered from the Ashe Ferry site, although in very small numbers. Chenopod (*Chenopodium* sp.), knotweed (*Polygonum* sp.), little barley (*Hordeum pusillum*), and maygrass (*Phalaris caroliniana*) are considered starchy seeds (primarily sources of carbohydrates), while bearsfoot (*Smallanthus uvedalius*) and sunflower (*Helianthus annuus*) are considered oily seeds (good sources of protein and fat). None of these (with the possible exception of sunflower) appear to represent cultigens; the chenopod most closely resembles wild forms. Many plants that produce starchy and oily seeds colonize open ground, are abundant seed producers, and in favorable conditions may grow in relatively pure stands, producing large quantities of easily collected seeds. Bearsfoot, chenopod, knotweed, and sunflower all ripen from late summer into the fall. Maygrass and little barley ripen in spring, and may have been important sources of carbohydrates during a typically "lean" season. Smith and Cowan (2003) suggest that these wild grains may have been cultivars, if not domesticates, that lack distinguishing morphological changes from wild forms.

In general, grains were first parched, then used in stews or "gruels," or ground into meal that could be added to stews or made into bread. Oily seeds were also consumed in similar ways, although sometimes they were first removed from their woody pericarps. While the uses of the seeds of these plants are most often enumerated, chenopod and knotweed leaves are edible and are good sources of vitamins and minerals (Scarry 2003; Moerman 2003).

Cultigens

Maize is the only definite cultigen identified in the Ashe Ferry site samples. Seven maize cupules and three kernel fragments are distributed among Ashe Ferry phase and Early Brown phase contexts; associated AMS dates indicate maize was present as early as ca. A.D. 1000. The incidence of maize on this time horizon is consistent with evidence from across the Eastern Woodland, where maize appears sporadically after circa A.D. 200, but does not appear consistently or in quantity until circa A.D. 900 (Scarry 2003). Explanations for this temporal pattern are varied; researchers have posited that early maize may have been restricted to ceremonial contexts, that it may have been harvested green and eaten uncooked, or that it may have remained a minor crop because it involved such a large labor investment (Smith and Cowan 2003). The early development of Mississippian cultural patterns in the southeastern United States is typically marked by the intensification of maize farming in both the interior and lower southeast regions. Late Woodland pattern societies beyond the Mississippian pale (e.g., Uwharrie phase, Dan River phase) apparently took up substantial maize horticulture by A.D. 1100.

The cupule and kernel fragments recovered at 38YK533 are too fragmentary for varietal identification. The low incidence of maize at 38YK533 is consistent with interpretation of the site as a special purpose, seasonal camp where activities focused on collection, processing, and consumption of nuts. Maize may represent provisioning supplies brought to the camp from residential/farming bases and used to augment arboreal seeds or as a carbohydrate bridge until nut processing created an abundant food supply. The presence of maize in both Ashe Ferry phase and Early Brown phase contexts clearly indicates the incorporation of this cultigen in these terminal Woodland period and early Middle Mississippian period subsistence economies, but the relative paucity of maize in these contexts does not speak to its relative importance in these systems.

Miscellaneous Taxa

A residual miscellaneous category includes 78% of the non-nut material identified in the Ashe Ferry assemblage. A large number of the plant remains in this category were related to pine trees, comprising both cone fragments, scales, and pitch (n=545). Pine trees are a common part of woodland habitats, and it is likely that these remains were carbonized as partially combusted fuels. A grass node (Poaceae family), sedge seeds (n=4), and a legume fragment (Fabaceae family) were likely accidental hearth inclusions, and probably reflect vegetation cover in the immediate environs of the site.

Other miscellaneous plant remains may represent similar accidental inclusions, but derive from plants with known uses documented in southeastern ethnohistoric and ethnographic records. For instance, two holly (*Ilex* sp.; not yaupon) seeds may reflect any number of medicinal applications for *Ilex*, including use as dermatological aids, eye drops, antidiarrheals, and cathartic emetics (Williams 2000). Pokeweed (*Phytolacca* sp.), represented by three charred seed fragments, is an aggressive colonizer of disturbed ground. Young poke leaves can be cooked as a spring green, and the dark purple berries are edible (after cooking) and can be used as a source of dye or ink. The berries and roots are also used medicinally as internal or external antirheumatics. Poke root preparations can be applied to ulcers, swellings, bunions, and other skin related ailments. Depending on the preparation, application, and dosage, pokeweed can be used as both an antidiarrheal and cathartic agent (Williams 2000).

Thirty-four purslane (*Portulaca* sp.) seeds from the site represent a weedy plant that rapidly invades waste areas. The fleshy parts of purslane are edible, and medicinally it was used to sooth wounds and quiet gastrointestinal problems. Similarly, eleven spurge seeds (4 *Euphorbia* sp. and 7 Euphorbiaceae family) were found. Spurges can be used as oral aids, purgatives, dermotological aids, and cough medicines (Williams 2000).

One likely *Hypericum* sp. seed was found, the most common species of which is known as St. Johnswort. Unlike many other plants, this is only known to have medicinal usages, including as febrifuges, cough medicine, kidney aids, and for multiple reproductive and gynecological problems (Williams 2000).

Conclusions

Analysis of archaeobotanical samples from the Ashe Ferry site reveals assemblages of foodstuffs heavily (almost exclusively) dominated by arboreal nut remains, with markedly low incidence of cultigens, edible seeds and fruits. This skewed pattern is evident in all of the samples, regardless of context type or age, an indication of continuity in specialized subsistence behaviors at the site across almost three centuries of occupation. These focal botanical patterns differentiate the Ashe Ferry assemblages from the more diffuse assemblages of Woodland and Mississippian period residential bases in the surrounding region (e.g., Aulbach-Smith 1984; Crites 2001; Gardner 1985, 1986; Hollenbach 2010a, 2010b). This large, but narrowly focused assemblage, when considered with the limited suite of facilities identified at Ashe Ferry and the patterned distribution of botanical remains associated with those facilities, presents a case for interpretation of the site as a specialized "acorn camp" (mast processing station) during the Ashe Ferry and Early Brown phase occupations.

From this interpretive perspective, some reconstruction of the activities that generated the archaeobotanical residues at Ashe Ferry can be hypothesized. For instance, evidence of *in situ* burning in shallow, fire-crack rock filled basins, and the strong association of charred acorn nutshell fragments with these features is consistent with their hypothesized use as acorn roasting facilities. Such mass roasting or parching of acorns to cook nuts for immediate use or to dry acorns for further processing and storage is congruent with ethnohistoric accounts of acorn processing in the Southeast, Northeast, Midwest, and California (e.g., Converse 1908, Densmore 1928, Harriot 2007[1590], Heathy 1963; Lederer 1672; Lawson 1709; Ortiz 1991; Petrusco and Wickens 1984; Smith 1923; Tantaquidgeon 1972). In this process, unshelled acorns may have been spread on hurdles over heated rocks (see Harriot 2007), or simply heated directly in beds of ashes and embers above heated rocks. Acorn roasters would closely monitor this process, and regularly stir the nuts to make sure they dried evenly and did not scorch. The shells of sound, intact acorns popped or cracked open from escaping steam, while insect damaged acorns vented steam through worm holes, and did not pop. As they tended the drying nuts, acorn processors culled and discarded nuts with insect damage; if these discarded spoiled nuts were tossed in the fire, the low heat appropriate for parching would create favorable conditions for carbonization. If parched nuts were shelled before they were stored, people tending the rock ovens might work on cracking nuts from a roasted batch while another batch was parching, and consign the empty shells and worm infested meats to the fire.

The parched, shelled sweet acorns might be used directly or stored without further processing. Shelled bitter acorns required leaching of tannins to be edible. California natives often performed this task by grinding the shelled acorns to meal, then placing the meal in shallow basins dug into sand, and pouring repeated washes of cold (or sometimes heated) water through the meal (Chestnut 1902:336; Goddard 1903:28; Ortiz 1991). Flushed tannins quickly percolated from the meal through the sandy matrix. Ortiz (1991) indicates this procedure was typically undertaken streamside, where sandy matrices and abundant fresh water were immediately available. The very sandy, well sorted matrix at 38YK533 is ideal for the leaching process, and proximity to the Catawba River guarantees a ready water supply.

Various ethnographic sources also allude to less active methods for leaching acorn tannins. In some cases, bagged shelled acorns were placed into flowing water and left for several days to facilitate tannin flushing. In other instances, shelled or unshelled acorns were buried for longer periods in large pits, where tannin leaching was accomplished by percolation of precipitation through the soil (Gifford 1936, Gunther 1973; Harper 1971; Moerman 2002). On the Northwest Coast, Mathews (2009) has documented archaeological examples of acorn filled pits in zones of freshwater tidal fluctuation. Longer term pit-based leaching of acorns is also documented in Jomon period contexts in Japan (Habu 2004: 64-68) and Kuahuquio culture contexts in the Yangzi River Valley of China (Underhill 2013:543).

The large, deep pits at Ashe Ferry might have served a similar function in acorn processing, in which longer-term subterranean caching of shelled nuts promoted leaching of tannins via percolation of precipitation or fluctuation of groundwater. These deep pit facilities are situated on the terrace backslope at 38YK533, where the finer grained, slightly silty sand matrix has sufficient cohesion and structural integrity to support pit walls. These sediments, while highly permeable, do not drain as rapidly as the sands on the terrace crest, and may have been better suited to slower leaching through repeated saturation and drying (as compared to rapid flushing).

Althernatively, these pits may have functioned to simply hold acorns (and other foodstuffs) in storage until retrieval. Ethnographic and ethnohistoric accounts from eastern North America (e.g. Densmore 1924; Heathy 1963) attest to pit storage of acorns, and recent experimental archaeology (Cunningham 2002) has explored the viability and efficacy of pit storage for acorns and other nuts.

Unfortunately, none of these deep pits yielded primary stored deposits. The contents recovered from these contexts instead reflect the secondary (or tertiary) use of these facilities as trash receptacles. After these pits were emptied of their primary content and were no longer maintained, sandy pit walls probably collapsed, leaving depressions that filled with mixtures of sand, remnants of the stored nuts, surface debris and intentionally dumped refuse. This deterioration process would accommodate the presence of residues such as the mass of charred acorn meats found in Feature 28 as either discarded remnants of a camp meal gone awry, or acorn meats found to be over-parched in the drying or roasting process. The sparse incidence of crop and fruit remains in these contexts may reflect either dumping, or incidental inclusion of debris from foods brought as camp provisions.

Similarly, the deposits of charred hickory nutshell in the four storage pits may indicate that the Ashe Ferry camp was used for gathering and collecting hickory nuts as well as acorns. However, hickory shell is truly abundant in only two pits, even though hickory nutshell is more apt to be preserved by carbonization than acorn shell due to its high density and resistance to combustion. If hickory nuts were being processed at Ashe Ferry with the same intensity as acorns, hickory nutshell would be more abundant and widespread; Yarnell and Black (1985:97-98) even suggest that analysts estimate acorn to hickory ratios by applying a factor of 50 to acorn nutshell weights when compared to hickory nutshell weight. In both features where hickory nutshell is abundant, there are no large pieces of shell indicative of the initial stages of cracking nuts. Instead the hickory nutshell fragments tend to be small or very small, consistent with the heavily crushed shell residues created as a by-product of rendering hickory oil or cooking *kenuchee* soup. Therefore, it appears that hickory processing was incidental to other activities at the site or that the hickory nutshell residues may derive from processed camp provisions (e.g. *kenuchee* balls*)* introduced to the site.

Interpretation of the Ashe Ferry phase and Early Brown phase components at 38YK533 as sporadically occupied acorn collection/processing camps appears consistent with the character of the archaeobotanical assemblage and the types and spatial configuration of facilities defined there. However, because Late Woodland and early Middle Mississippian period components have been previously poorly documented in the central Piedmont region of the Carolinas, it is unknown how such specialized extraction camps might fit into settlement/subsistence systems in the region, and relevant comparative data are difficult to obtain. Instead, it may be productive to model understanding of the Ashe Ferry occupations through analogy to ethnographic and ethnohistoric accounts of gatherer-hunter economies of native California, where balanophagy, and its associated human ecologies are best documented. In California, where acorn gathering and use reflect highly structured systems developed over thousands of years, particular lineages claimed specific acorn groves through traditions of use and management. Women (who principally took charge of gathering wild plant foods and managing plant production) improved oak groves by burning the leaf litter under the trees (after acorn harvests). Low intensity burning reduced future weevil infestations, improved visibility for nut gathering, and promoted development of well-rounded and productive trees (Anderson 2005). Similar fire-based arboriculture techniques to encourage mast production were practiced by southeastern native peoples (Abrams and Nowacki 2008; Hammett 1992), and native women and their matrilineages in the Carolina piedmont may have asserted hereditary claim to mast producing groves through such management and multigenerational use.

In California, acorn camps were situated within or adjacent to groves (typically where sandy soils and water supply facilitated leaching). These were seasonally occupied stations, components of larger yearly settlement subsistence cycles. Exploitation of particular groves depended on acorn productivity, and was not necessarily annual, a pattern consistent with evidence from Ashe Ferry, where botanical evidence for seasonality (and limited range and density of facilities) indicate repeated fall occupations that were not necessarily immediately sequential. Because acorns must be secured quickly once they ripen and fall, scheduling of occupation and primary use of the Ashe Ferry site probably coincided with the September-October ripening of *Q. alba* and *Q. rubus* acorns in the central Piedmont (Radford, et al. 1968).

Thus, Ashe Ferry was most likely a temporary camp or even a daytime activity area where acorns were processed in the early fall. The work groups that visited the camp were probably multi-generational family or lineage segments, and gender and age roles probably shaped camp-based activities. Adult women, who may have asserted matrilineal use rights to the oak groves on nearby terraces and hillslopes, probably gathered acorns and brought them to the flat sandy terrace by the river ford for parching and storage. Younger family members and older family members with reduced mobility may have undertaken much of the camp based acorn processing.

Good mast years not only attracted people to the oak groves, but also drew deer, turkey, bears and other species to feast on the acorn crops. These animals probably avoided groves where women were gathering, chatting and banging the trees with poles to shake down acorns. Hunters (predominantly adult and adolescent males) knew where the women were working and sought quieter, more distant groves to hunt game. Such scheduled co-ordination of hunting and nut collecting from the Ashe Ferry camp base might account for the numerous projectile points recovered from the "acorn camp," a probable multi-function base for concurrent extraction activities. Proximity to the river and an established fish weir (38YK535/38La569) presented opportunities to catch fish, frogs, turtles, crayfish and other aquatic species that remained active at the beginning of the acorn season.

Occupations of the site probably continued for weeks at a time, and work parties may have constructed temporary shelters to guard against inclement weather. In addition, these family segments likely arrived at the camp with necessary equipage and supplies, such as baskets for nut collecting and processing, pottery vessels for cooking and hot water leaching of acorns, bows and arrows, snares, nets, and other hunting tools, and provisions to consume until hunting, fishing, and nut collecting yielded abundant feasts.

The location of the Ashe Ferry camp at the Twelvemile Creek ford of the Catawba River provided ready access to the camp via established trails, and the periodic occupants of Ashe Ferry might have used these trails to travel considerable distances to the oak groves near 38YK533. Undoubtedly, the camp was linked to more permanent residential communities (like the Ashe Ferry phase sites that probably existed across the river at 38La125 or downriver at Landsford), and was part of a much larger landscape of activities that remains to explored and documented.

Archaeofaunal Remains from the Ashe Ferry Site (38yk533), York County, South Carolina
by: Thomas R. Whyte

By contrast to the abundant archaeobotanical remains recovered from 38YK533 contexts, the sample of faunal remains from the site appears markedly impoverished. The total sample of bone fragments from 38YK533 constitutes only 183g of osseous material, and yielded only 103 specimens identifiable to family level. As such, the sample is, perhaps, more informative about taphonomic process than about the subsistence behaviors of the Ashe Ferry and Early Brown phase inhabitants of the Ashe Ferry site. Nonetheless, identifiable faunal materials from 38YK533 illustrate the use of a wide range of species as protein sources by site occupants. The following account presents the methodology and results of analysis of archaeofaunal remains from the Ashe Ferry site, and examines the probable causes and meaning of the condition of the assemblage.

Methods of Identification and Analysis

Specimens were examined by the author to identify the anatomical element (bone, tooth, etc.) and species represented, the portion (distal, proximal, etc.) and side (left *versus* right) represented by each element, and when possible, the age and sex of the individual represented. Each specimen also was examined for evidence of artificial modification (cut marks, polish, striations, etc.), burning, perimortem or postmortem breakage, carnivore or rodent gnawing, and digestion. Specimens from each provenience unit were weighed (to the nearest tenth of a gram) in broad taxonomic groupings (usually by class) and, with the exception of indeterminate vertebrate bone, were counted. Although they were weighed, the latter exceptions are too numerous and fragmentary, often in part because of recovery and processing damage, for their enumeration to have any meaning.

Identification of specimens was made with reference to the comparative collection in the Zooarchaeological Lab at Appalachian State University. This collection is nearly comprehensive for the Holocene vertebrate fauna of the study region, lacking only in extinct species and a few species of salamanders, snakes, cyprinid fishes, and migratory passerine birds. Specimens of rare fish species (family Catostomidae) were borrowed from Robert E. Jenkins of Roanoke College, Virginia. Other Catawba River fishes were generously donated to the comparative collection by David J. Coughlan of Duke Energy. Arthur E. Bogan of the North Carolina Museum of Natural Sciences provided identifications of some freshwater mussel shell. Some specimens evidently fractured during archaeological recovery (as indicated by an absence of soil staining on fracture surfaces) were combined when possible and recorded as individual specimens. As a result, specimen totals presented for any one provenience here may be fewer than those reported in the RLA's preliminary inventories for the site. Potentially conjoinable fragments that had broken apart prior to excavation were recorded as individual specimens.

A final note to be made is a point on current convention in presenting the vernacular or common names of animals in scientific literature. Most biological sciences have begun to capitalize official common names such as "Wild Turkey" but to retain lower case in naming more general groupings such as "turkey." This new convention is followed herein.

Potential Biases

Evidence of preservation bias in the sample was immediately apparent at the start of this analysis. Several contexts, both subsurface (features) and surface (plow zones and strata), yielded only calcined vertebrate remains while others (especially larger subsurface features) contained a combination of burnt remains and ones not affected by fire. Higher frequencies of especially calcined bone, when conditions of burial and soil acidity and moisture are relatively similar, are usually an indication that unburned bones in those same deposits have experienced more degradation by microbial and microfaunal consumption of organic components (Whyte 1997, 2001, 2011). Consequently, the 38YK533 contexts yielded few (357) enumerated specimens and the sample exhibits a high frequency of burnt specimens despite an abundance of subterranean feature contexts.

Use of varying mesh size in recovery of archaeofaunal specimens must also be taken into account when comparing contexts (Reitz and Wing 2008). Sediments passed through quarter-inch mesh are less likely to contain remains of smaller vertebrates and invertebrates (e.g., land snails, toads, mice, passerine birds) and the smaller elements (e.g., scales, phalanges, carpals, and teeth) of mid-sized vertebrates. However, content of soils from feature contexts at 38YK533 whether wet-screened or flotation processed, were minimally recovered by 1/16th-inch mesh.

Certain vertebrate specimens, despite their extreme fragmentation and diminutive size, remain identifiable to some degree because of their distinctive textures or unique structures. These include catfish (*Ameiurus* spp.) pectoral spines, turtle (Testudunes) carapace and plastron (costal) bones, and deer tooth enamel. Taxa and elements represented by these specimens relative to others are thus better represented in the resulting data. This is especially true for the many proveniences that yielded only small crumbs of calcined vertebrate remains.

Results

Archaeofaunal remains from the prehistoric Ashe Ferry site (ca. AD 950-1350) amount to 357 enumerated specimens (Table 7.4; Appendix F5) and 12.3 g (6.7 % of the assemblage by weight) of indeterminate vertebrate remains. These were recovered from 31 subsurface features (78%) and from the old plow zone (12%). As expected, feature contexts exhibited better faunal preservation; the majority of specimens (particularly those identifiable to genus and species groups) were recovered from features, and a higher frequency of calcination of bone is observed among specimens from the old plow zone. Seventy-three percent of specimens are burnt, many (38%) features yielded *only* calcined bone, and only three features (20, 41, and 46) yielded more than 20 identifiable specimens. Two of these (Feature 41 and 46 [Zone A]) appear to be the most recent (Late Mississippian period) features on the site—a further indication of compromised age-related preservation.

A range of aquatic and terrestrial groups is represented by the collection (Table 7.4). Five (freshwater mussel, bullhead catfish, venomous snake, non-venomous snake, and Eastern Box Turtle) are represented by only one specimen each. A mere 16% of counted specimens was identifiable to genus or species (Table 7.4), and one species is likely intrusive to the prehistoric contexts, possibly from more recent death events; two White-lipped Land Snail (*Triodopsis albolabris*) shells found in Feature 20 may have burrowed into the feature fill or were inadvertent components of the fill. There is no archaeological evidence of their consumption by humans in eastern North America. The Domestic Dog remains (two teeth and part of a maxilla) in Feature 43, a human burial, are not burnt and may be what has survived of a burial companion or offering. Turtle (order Testudines) and White-tailed Deer (*Odocoileus virginianus*) remains, due to identification/preservation bias discussed above, are clearly inflated in number relative to other groups.

These exceptions aside, and identification and preservation biases realized, the suite of fauna represented in the 38YK533 assemblage is typical for late prehistoric sites in the Carolina Piedmont where preservation is compromised (cf. Terrell 1998). Yet, however patterned the taphonomic reduction of the assemblage over time may have been, it would be folly to attempt a reconstruction of the relative dietary importance of the animal groups that have remained represented in the recovered assemblage. Wild riverine and terrestrial woodland fauna were utilized. White-tailed Deer remains comprise the majority of identifiable specimens and are dominated by cranial and foot elements (84%) probably due to density-mediated preservation and identification bias. Most of the 11 unidentifiable large mammal and 254 mammal remains are undoubtedly from bones of deer reduced in accessing marrow (perimortem fracture was observed on numerous specimens) and by various taphonomic processes.

Representation of poikilothermic species (fishes, snakes, and turtles) indicates probable deposition outside of the winter months. The only possible indication of deposition in late fall or early winter includes the deer antler fragments found in Features 28, 50, and especially 75. None of the fragments, however, is from the point of origin from the frontal bone to indicate whether they were shed or remained attached at death. The antler fragments from Feature 75 are probably

Table 7.4. Number of Identified Specimens (NISP) of Animal Remains from 38YK533.

Scientific Name	Common Name	NISP
Triodopsis albolabris	White-lipped Land Snail	2
Unionidae	Freshwater Mussel	1
Ameiurus sp.	Bullhead Catfish	1
Osteichthyes	Bony Fish	3
Crotalinae	Pit Viper	1
Colubridae	Non-venomous snake	1
Sternotherus odoratus	Stinkpot	3
Terrapene Carolina	Eastern Box Turtle	1
Testudines	Turtle	20
Meleagris gallopavo	Wild Turkey	2
Aves (large)	Large Bird	9
Canis familiaris	Domestic Dog	3
Odocoileus virginianus	White-tailed Deer	44
Mammalia (large)	Large Mammal	11
Mammalia	Mammal	254
Vertebrata	Vertebrate	*
-		Total counted specimens: 357

*Unidentified vertebrate remains, extremely numerous and fragmentary, were weighed (12.3 g) but not counted.

parts of an antler tool that was clustered with other (stone) tools representing a cache. None of the other identifiable deer teeth or bone fragments from the site is sufficiently preserved or otherwise suitable for estimates of seasonality.

Most of the contexts from this site that contain sufficient numbers of specimens for comparison are assigned to the Late Woodland component (Features 20, 43, & 50). Feature 46 (21 specimens) contains both Early Brown phase and Ashe Ferry phase strata. Feature 41, an Early Brown phase pit yielded the most specimens of any site context. All of the 81 archaeofaunal specimens recovered from this feature are calcined—an indication of compromised faunal preservation. Yet this is the only feature on the site that contained remains identifiable as bullhead catfish (*Ameiurus* sp.) and Stinkpot (*Sternotherus odoratus*). Like many of the Ashe Ferry phase features on the site, Feature 41 also contained remains of White-tailed Deer (*Odocoileus virginianus*). Nevertheless, broader vertebrate class (fishes, reptiles, birds, and mammals) compositions between site components vary insignificantly.

Conclusions

The archaeofaunal assemblage recovered by the 2010 investigations at the Ashe Ferry site illustrate the marked effects of post-depositional chemical and physical weathering on bone material. The acidic soil environment, coupled with excessive water percolation that rapidly flushed buffering media (e.g., wood ashes) and disintegrating bone surfaces, reduced non-calcined bone to the densest and most resistant elements, and severely biased species and element representation. Much of the identifiable bone from the site is calcined through burning—which eliminates immediate organic content and reduces the matrix to more stable hydroxyapatites, which are less susceptible to chemical and physical weathering. Burning of animal bones may reflect accidental or random inclusion of food remains in hearths, or may reflect more focused, inclusive disposal, as documented by John Lawson (Lefler 1967:52) among the Keyauwee Indians in 1701: "All the Indians hereabouts carefully preserve the Bones of the Flesh they eat, and burn them, as being of Opinion, that if they omitted that Custom, the Game would leave their Country, and they should not be able to maintain themselves by their Hunting." While such ritual may have been spatially and temporally restricted (this observation was 75 miles from Ashe Ferry and 600 years after the Ashe Ferry phase), it nevertheless provides an example of how even apotropaic behaviors may influence bone survivability.

Combined Late Woodland and Mississippian archaeofaunal remains from Ashe Ferry (Table 7.4), although significantly reduced by depositional and taphonomic processes, are probably reasonably representative of late prehistoric seasonal extraction camp sites in the Carolina Piedmont. As such, the evidence from Ashe Ferry complements the better documented archaeofaunal patterns at long-term residential sites such as Donnaha (Mikell 1987) and Hunting Creek (Terrell 1998), and presents a more complete view of the seasonal aspects of Late Woodland period diet in the central Piedmont region. The Ashe Ferry sample reinforces previous findings that indicate Piedmont Late Woodland subsistence economies as diffuse and highly diversified, with exploitation of a wide range of species captured through various combinations of hunting, trapping, collecting, and fishing. As with all other comparable sites in the region (e.g., Terrell 1998), the prominence of White-tailed Deer remains at Ashe Ferry indicates preferential use of large bodied mammals for protein—but a preference necessarily augmented by a multitude of smaller species. The dog remains recovered from Ashe Ferry were derived from a human burial and are not recognized as food refuse. The relative abundance of snake and turtle remains in the assemblage may indicate significant contribution of meat obtained by members of the society engaged in daily foraging and gardening.